



## LUMPED LC SURFACE MOUNT

# Diplexer

## RDP-100-2R15+

50Ω DC to 2150 MHz (DC - 100 MHz, 950 - 2150 MHz)

### KEY FEATURES

- Low Insertion Loss, 0.5 dB Typ.
- High Stopband Insertion Loss in Low Pass with 60 dB Typ. and High Pass with 70dB Typ.
- Miniature shielded package
- Good Return Loss in Low Pass and High Pass 20 dB Typ.

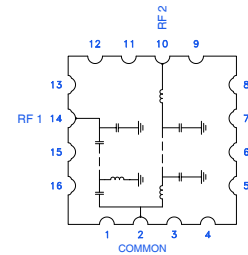


Generic photo used for illustration purposes only

### APPLICATIONS

- Aerospace
- Satellite

### FUNCTIONAL DIAGRAM



### PRODUCT OVERVIEW

Mini-Circuits' RDP-100-2R15+ is a low-pass + high-pass combination device. Low pass port is designed for DC to 100 MHz and high pass port is designed for 950 to 2150 MHz. Both low pass and high pass have high isolation and good return loss.

### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C

Parameter		Function (Port)	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	Low Pass (RF COM-RF1)	DC - 100	—	0.5	1	dB
		High Pass (RF COM-RF2)	950 - 2150	—	0.5	1	
	Return Loss	Low Pass (RF1)	DC - 100	14	20	—	dB
High Pass (RF2)		950 - 2150	14	20	—		
Common (COM)		DC - 100 950 - 2150	14 14	20 20	— —		
Stop Band Rejection	Low Pass (RF COM-RF1)	350 - 950	20	30	—	dB	
		950 - 2150	50	60	—		
	High Pass (RF COM-RF2)	DC - 100 100 - 350	60 20	70 30	— —		

1. Tested in Evaluation Board P/N TB-RDP-1002R15+.

### ABSOLUTE MAXIMUM RATINGS<sup>2</sup>

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power (RF COM) <sup>3</sup>	1.5 W
Input Power (RF1) <sup>3</sup>	1.5 W
Input Power (RF2) <sup>3</sup>	1.5 W
Max. DC Voltage	25 V
Max. Input Current	100 mA

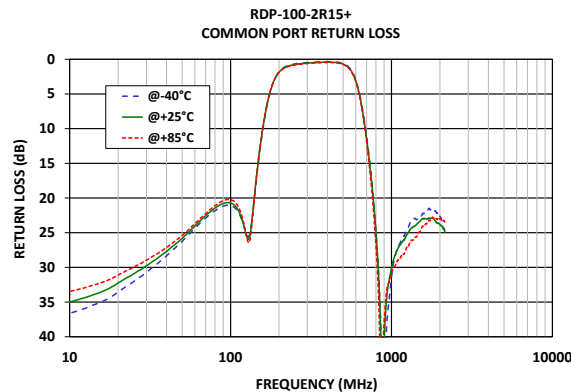
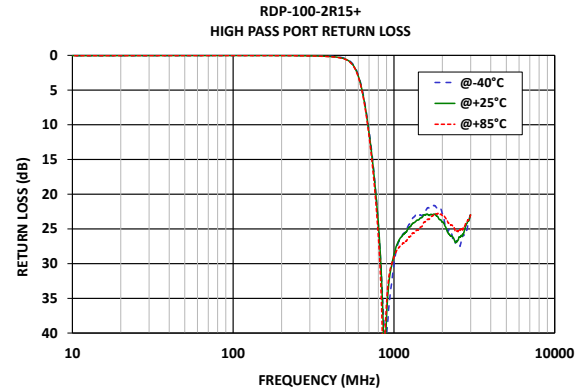
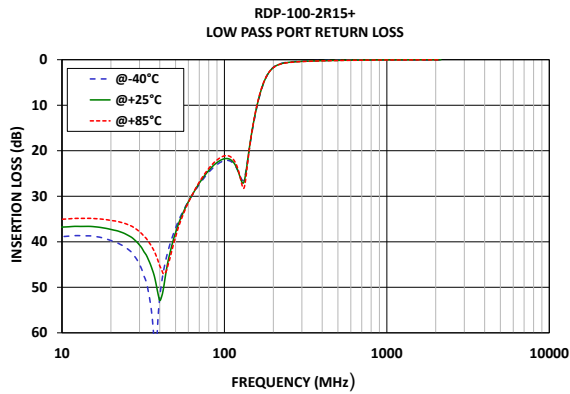
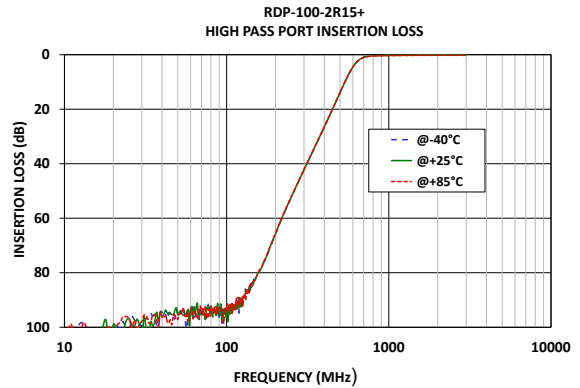
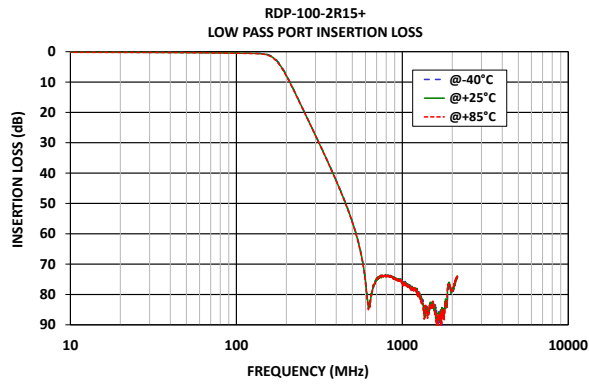
2. Permanent damage may occur if any of these limits are exceeded.

3. Power rating applies only to signals within the passband.





### TYPICAL PERFORMANCE GRAPHS





### FUNCTIONAL DIAGRAM

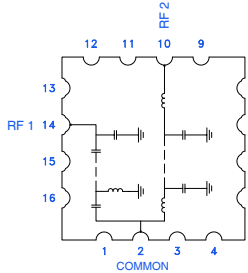


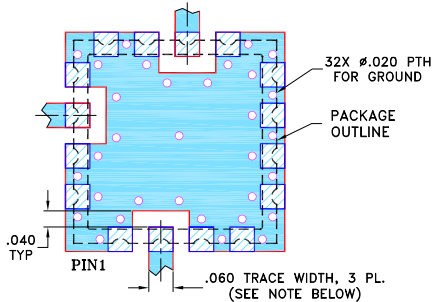
Figure 1. RDP-100-2R15+ Functional Diagram

### PAD DESCRIPTION

Port	Pad Number	Description
COMMON	2	Connects to Common Port
RF1	10	Connects to Low Pass Port
RF2	14	Connects to High Pass Port
GROUND	1,3-9,11,12,13,15,16	Connects to Ground on PCB, (See drawing PL-012)

### SUGGESTED PCB LAYOUT

SUGGESTED MOUNTING CONFIGURATION FOR CK605 CASE STYLE, "kg/h/16AM01" PIN CONNECTION



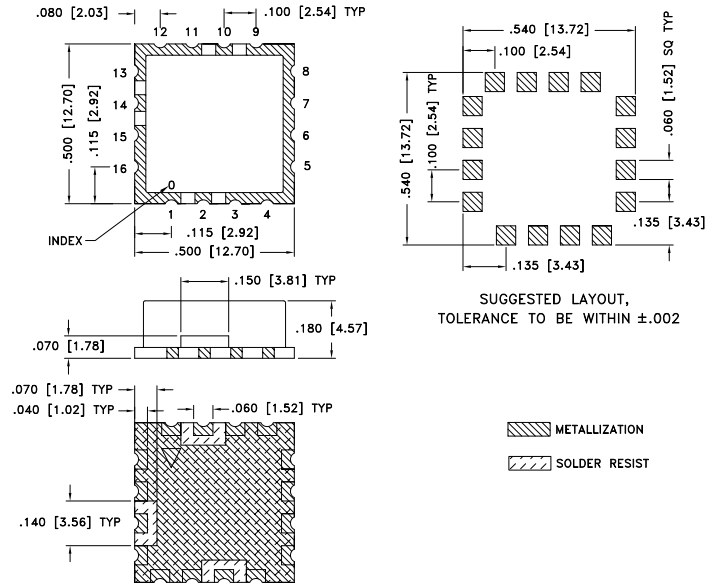
#### NOTES:

- TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE BOTTOM IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Figure 2. Suggested PCB Layout

### CASE STYLE DRAWING



SUGGESTED LAYOUT, TOLERANCE TO BE WITHIN ±.002

METALLIZATION  
 SOLDER RESIST

Weight: 1.2 gram

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015

### PRODUCT MARKING\*: RDP-100-2R15

\*Marking may contain other features or characters for internal lot control.



LUMPED LC SURFACE MOUNT

# Diplexer

## RDP-100-2R15+

Mini-Circuits

50Ω DC to 2150 MHz (DC - 100 MHz, 950 - 2150 MHz)

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file) De-embedded to device pads
Case Style	CK605 Lead Finish: Gold over Nickel Plate
RoHS Status	Compliant
Tape and Reel	F37
Suggested Layout for PCB Design	PL-012
Evaluation Board	TB-RDP-1002R15+ Gerber File
Environmental Rating	ENV03T2

### NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
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# Surface Mount Diplexer

# RDP-100-2R15+

## Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)						CROSS OVER ISOLATION (dB)		
	Low Pass Port			High Pass Port			(between LPF and HPF)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	0.14	0.17	0.19	97.24	90.85	86.36	90.89	88.23	90.08
5	0.15	0.18	0.20	92.61	97.63	94.94	86.71	89.68	93.58
10	0.15	0.18	0.21	123.66	104.89	106.83	101.33	102.81	106.88
50	0.25	0.28	0.31	95.33	95.38	97.05	93.59	92.81	94.31
100	0.42	0.47	0.51	94.14	94.88	93.61	91.89	93.27	91.55
130	0.50	0.57	0.61	85.83	88.18	89.13	87.46	86.05	88.92
160	1.26	1.40	1.51	79.08	79.38	78.68	79.36	79.55	79.23
190	5.49	5.70	5.93	69.10	69.13	68.88	73.73	73.66	73.70
200	7.62	7.82	8.05	65.74	65.71	65.41	72.77	72.74	72.92
250	18.47	18.56	18.65	52.37	52.26	52.18	71.21	71.16	71.17
280	24.11	24.20	24.23	46.09	45.99	45.86	70.81	70.90	70.38
300	27.55	27.65	27.68	42.30	42.23	42.07	70.32	70.30	70.11
350	35.34	35.48	35.53	33.85	33.84	33.73	69.62	69.98	69.96
370	38.23	38.39	38.46	30.81	30.81	30.73	69.76	69.66	69.64
400	42.40	42.57	42.68	26.49	26.51	26.47	69.28	69.41	69.33
430	46.45	46.61	46.75	22.46	22.46	22.47	69.09	69.24	69.35
460	50.46	50.65	50.83	18.65	18.66	18.66	69.26	69.34	69.31
490	54.57	54.73	54.89	15.05	15.04	15.06	69.49	69.68	69.75
500	55.93	56.17	56.31	13.91	13.88	13.90	69.62	69.75	69.77
550	63.72	63.97	64.26	8.63	8.61	8.62	70.71	70.81	70.89
580	69.81	70.01	70.40	5.98	5.98	6.00	72.22	72.12	72.18
610	78.30	79.18	80.24	3.87	3.91	3.94	73.55	73.86	73.61
640	81.58	81.92	84.14	2.38	2.45	2.48	74.83	74.96	74.62
700	75.21	74.62	74.73	0.93	1.01	1.04	74.38	74.80	74.53
750	74.00	74.08	74.04	0.52	0.60	0.64	74.07	74.04	73.98
770	73.95	74.27	74.16	0.44	0.52	0.57	74.09	74.10	73.95
800	74.14	73.90	73.81	0.36	0.44	0.49	73.73	73.79	74.21
850	74.25	73.96	74.18	0.30	0.37	0.42	74.52	74.26	74.37
900	74.48	74.66	74.81	0.26	0.33	0.38	74.99	75.09	75.00
950	74.93	74.89	75.33	0.23	0.30	0.35	75.49	75.66	75.62
1000	75.88	76.10	76.17	0.21	0.28	0.33	76.54	76.52	76.45
1050	75.88	76.30	76.24	0.19	0.27	0.31	78.43	77.60	78.29
1100	76.89	77.36	77.57	0.18	0.25	0.29	77.82	78.55	78.52
1150	77.72	78.13	78.25	0.17	0.24	0.28	79.41	78.98	78.79
1200	78.55	78.30	78.53	0.16	0.23	0.27	79.41	79.78	80.04
1250	78.78	79.93	80.54	0.16	0.22	0.26	81.16	80.90	81.28
1300	80.99	81.24	82.17	0.15	0.22	0.26	81.95	82.56	82.90
1350	85.54	86.42	85.95	0.14	0.21	0.25	85.77	88.95	89.71
1402	84.37	84.20	84.89	0.14	0.20	0.24	88.04	86.56	88.40
1450	86.62	85.19	86.11	0.13	0.20	0.24	89.85	86.38	86.65
1510	83.29	83.85	85.02	0.12	0.19	0.24	83.81	83.44	85.06
1550	83.34	85.33	82.82	0.12	0.19	0.23	81.78	82.61	82.35
1602	85.13	87.00	89.43	0.12	0.19	0.23	86.04	87.95	88.37
1650	88.43	86.00	88.38	0.11	0.18	0.23	90.62	91.96	95.36
1710	87.59	85.69	88.96	0.11	0.18	0.23	87.55	88.96	86.71
1750	86.48	84.82	87.49	0.10	0.18	0.22	86.81	88.24	85.80
1822	82.45	81.47	83.49	0.10	0.17	0.22	85.75	87.22	88.64
1850	84.36	83.98	84.01	0.10	0.17	0.22	89.64	90.42	90.04
1886	78.30	76.55	76.74	0.09	0.17	0.22	84.12	81.53	80.39
1950	78.46	78.39	77.94	0.09	0.16	0.22	81.68	81.97	80.32
2002	78.42	78.36	78.08	0.08	0.16	0.22	79.98	78.82	78.83
2006	79.26	77.97	78.46	0.08	0.16	0.22	79.03	79.71	78.99
2010	78.31	78.08	78.97	0.08	0.16	0.22	79.25	79.49	78.45
2014	79.01	78.31	78.19	0.08	0.16	0.22	79.99	79.59	79.16
2018	78.31	78.82	77.86	0.08	0.16	0.22	79.60	79.18	79.35
2022	78.82	77.83	77.69	0.08	0.16	0.22	80.78	79.31	78.70
2026	77.97	78.39	77.73	0.08	0.16	0.22	79.97	79.18	78.51
2050	77.09	76.98	76.90	0.07	0.15	0.22	78.49	77.71	77.62
2102	75.63	75.69	75.22	0.07	0.15	0.21	77.30	76.89	76.54
2150	74.00	73.99	73.54	0.06	0.15	0.21	78.20	77.42	77.94



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IF/RF MICROWAVE COMPONENTS

REV. OR  
RDP-100-2R15+  
260427  
Page 1 of 2

# Surface Mount Diplexer

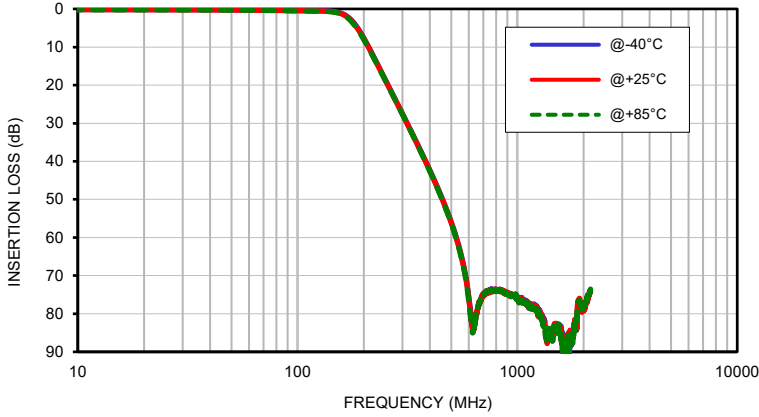
# RDP-100-2R15+

## Typical Performance Data

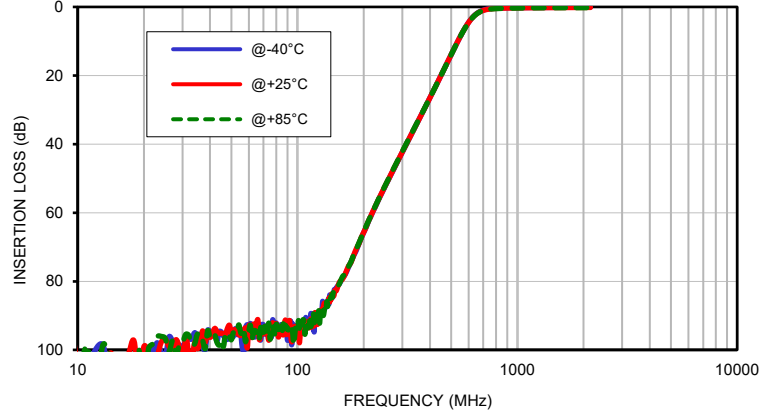
FREQUENCY (MHz)	RETURN LOSS (dB)								
	Common port			Low Pass Port			High Pass Port		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1	39.02	37.11	35.32	40.10	37.82	35.95	0.05	0.05	0.05
5	38.11	36.35	34.65	39.36	37.25	35.50	0.05	0.05	0.05
10	36.60	34.98	33.46	38.86	36.78	35.05	0.05	0.04	0.05
50	26.24	25.82	25.41	37.03	38.03	39.01	0.02	0.03	0.03
100	21.09	20.73	20.25	22.17	21.75	21.12	0.01	0.02	0.03
130	25.51	25.88	26.45	26.53	27.11	28.13	0.01	0.02	0.03
160	9.59	9.38	9.21	9.76	9.56	9.40	0.00	0.02	0.03
190	2.61	2.66	2.65	2.53	2.56	2.54	0.01	0.03	0.04
200	1.80	1.88	1.90	1.68	1.74	1.75	0.01	0.03	0.04
250	0.68	0.76	0.83	0.51	0.57	0.62	0.02	0.04	0.06
280	0.54	0.61	0.68	0.37	0.42	0.47	0.03	0.06	0.07
300	0.48	0.55	0.62	0.32	0.37	0.41	0.04	0.07	0.08
350	0.39	0.46	0.51	0.23	0.28	0.32	0.07	0.10	0.13
370	0.38	0.43	0.49	0.21	0.25	0.29	0.09	0.13	0.15
400	0.36	0.42	0.47	0.18	0.22	0.25	0.12	0.16	0.19
430	0.38	0.44	0.48	0.15	0.19	0.22	0.18	0.23	0.25
460	0.42	0.49	0.54	0.13	0.17	0.20	0.26	0.32	0.35
490	0.55	0.63	0.68	0.12	0.16	0.19	0.40	0.47	0.51
500	0.62	0.70	0.75	0.11	0.15	0.18	0.47	0.55	0.59
550	1.27	1.38	1.46	0.09	0.12	0.15	1.14	1.25	1.32
580	2.12	2.26	2.36	0.07	0.11	0.14	1.98	2.12	2.21
610	3.49	3.66	3.79	0.06	0.10	0.13	3.36	3.52	3.65
640	5.51	5.70	5.90	0.05	0.09	0.12	5.33	5.51	5.70
700	11.09	11.41	11.88	0.04	0.07	0.11	10.84	11.15	11.61
750	17.01	17.37	18.30	0.02	0.06	0.09	16.71	17.05	17.98
770	19.83	20.06	21.32	0.02	0.06	0.09	19.53	19.76	20.97
800	24.80	24.73	26.72	0.02	0.06	0.09	24.39	24.31	26.19
850	35.77	36.54	43.49	0.00	0.04	0.08	34.91	36.13	42.02
900	50.27	40.88	37.75	0.01	0.04	0.07	40.07	37.52	35.62
950	36.12	32.85	32.46	0.01	0.03	0.07	34.18	31.16	30.69
1000	31.42	30.14	30.91	0.02	0.03	0.06	30.06	28.70	29.04
1050	28.53	28.30	29.88	0.02	0.03	0.06	27.41	27.13	27.96
1100	26.98	27.20	28.97	0.02	0.02	0.06	26.32	26.26	27.43
1150	26.10	26.52	28.38	0.03	0.02	0.05	25.66	25.78	27.05
1200	25.45	25.99	28.00	0.03	0.02	0.06	25.07	25.38	26.71
1250	24.44	25.22	27.06	0.04	0.01	0.05	24.33	24.76	26.17
1300	23.68	24.64	26.48	0.04	0.01	0.05	23.54	24.27	25.67
1350	23.19	24.24	26.12	0.04	0.01	0.05	23.17	24.05	25.54
1402	22.97	24.00	25.66	0.04	0.00	0.04	22.91	23.71	25.15
1450	23.05	23.69	25.37	0.05	0.01	0.05	22.98	23.49	24.83
1510	22.97	23.33	24.82	0.05	0.01	0.05	23.01	23.24	24.46
1550	22.37	23.04	24.16	0.06	0.00	0.04	22.47	22.96	23.98
1602	22.10	22.97	24.00	0.05	0.00	0.04	22.08	22.88	23.69
1650	21.82	23.03	23.68	0.05	0.00	0.04	21.99	23.05	23.64
1710	21.49	22.89	23.20	0.06	0.00	0.04	21.66	22.92	23.22
1750	21.71	22.96	23.26	0.05	0.00	0.04	21.70	22.94	23.09
1822	21.75	22.97	22.86	0.06	0.00	0.04	21.81	23.02	22.80
1850	21.91	23.15	22.93	0.06	0.00	0.04	21.95	23.14	22.86
1886	21.97	23.45	22.91	0.05	0.00	0.04	22.01	23.36	22.81
1950	22.01	23.62	22.84	0.06	0.00	0.04	22.11	23.67	22.88
2002	22.65	23.84	23.04	0.06	0.00	0.04	22.79	24.01	23.06
2006	22.70	23.85	23.03	0.05	0.00	0.04	22.81	24.00	23.04
2010	22.78	23.90	23.04	0.05	0.01	0.04	22.83	24.00	23.03
2014	22.81	23.90	23.02	0.05	0.01	0.04	22.89	24.02	23.03
2018	22.83	23.89	22.99	0.05	0.01	0.04	22.95	24.03	23.03
2022	22.87	23.91	22.97	0.05	0.01	0.04	23.01	24.06	23.04
2026	22.91	23.92	22.95	0.06	0.00	0.04	23.09	24.08	23.04
2050	23.30	24.01	22.91	0.05	0.00	0.04	23.64	24.26	23.08
2102	24.37	24.42	23.26	0.06	0.00	0.04	24.79	24.79	23.49
2150	24.84	24.96	23.68	0.05	0.00	0.05	25.31	25.44	23.86

## Typical Performance Curves

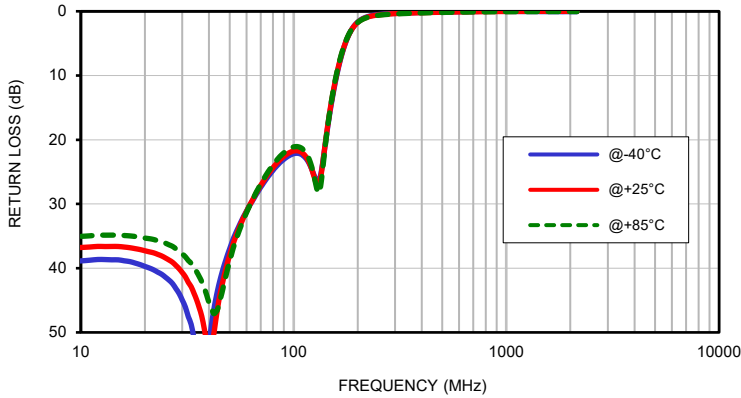
**LOW PASS PORT INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



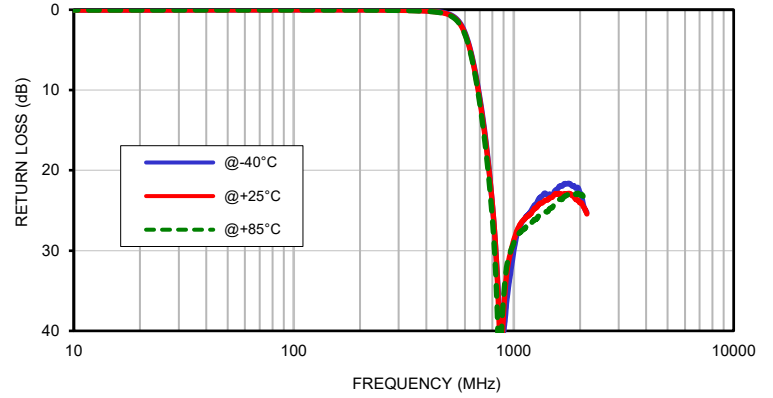
**HIGH PASS PORT INSERTION LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



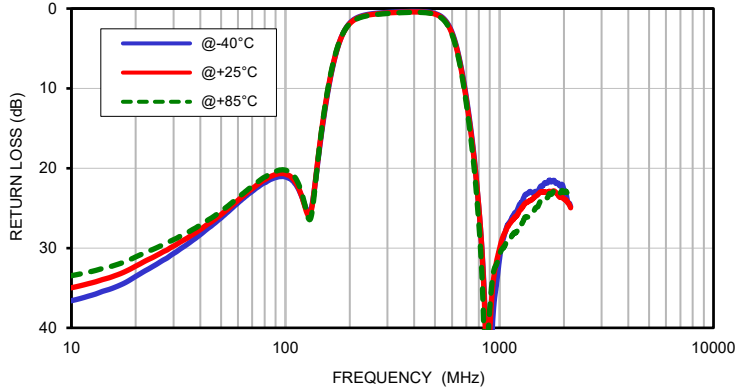
**LOW PASS PORT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



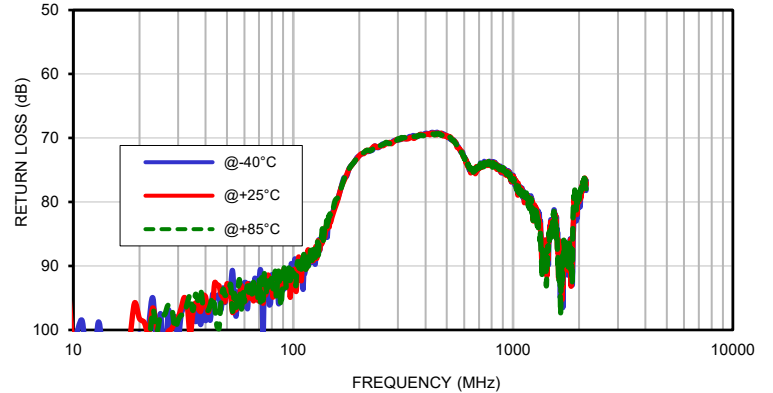
**HIGH PASS PORT RETURN LOSS vs. TEMPERATURE**  
INPUT POWER = 0 dBm



**COMMON PORT vs. TEMPERATURE**  
INPUT POWER = 0 dBm

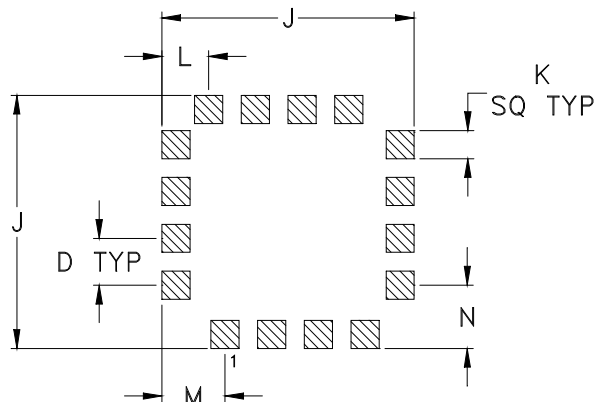
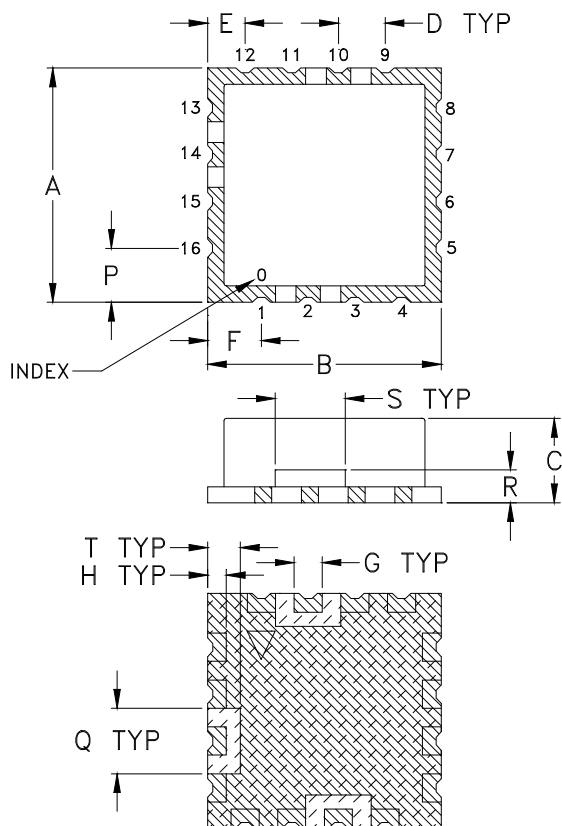


**CROSS OVER ISOLATION vs. TEMPERATURE**  
INPUT POWER = 0 dBm



## Outline Dimensions

## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm .002$

CASE #	A	B	C	D	E	F	G	H	J	K
CK605	.500 (12.70)	.500 (12.70)	.180 (4.57)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CK605	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	.070 (1.78)	1.2 +0.5 -0.0

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3Pl.  $\pm .015$

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:  
 For RoHS Case Styles: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
 All models, (+) suffix.



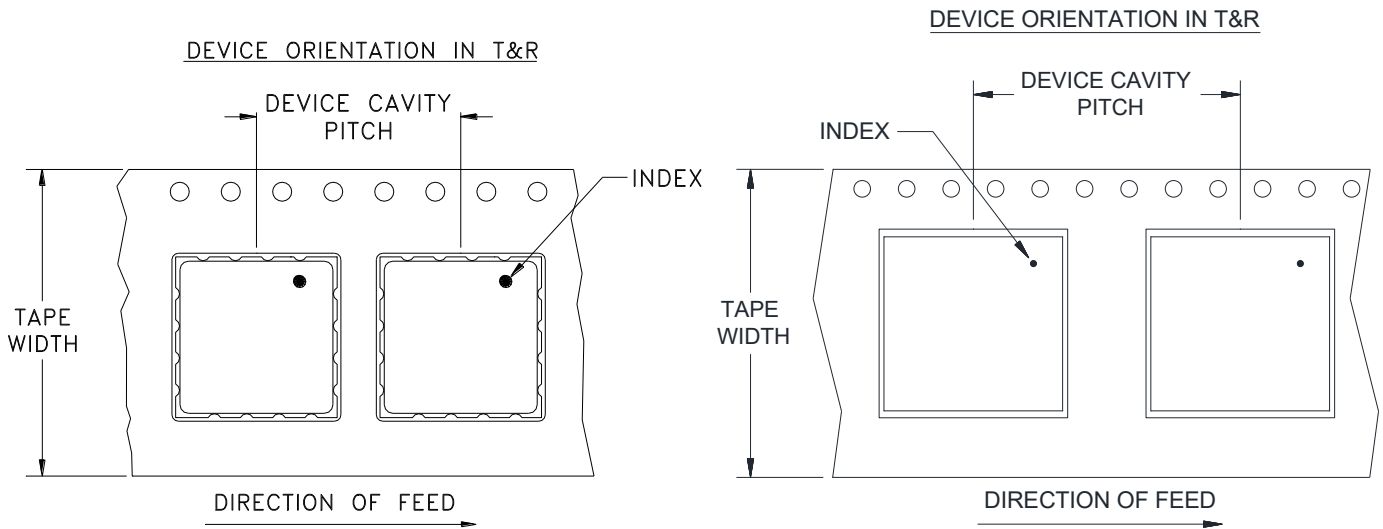
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
500				

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



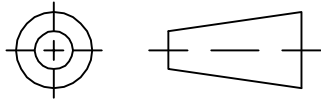
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

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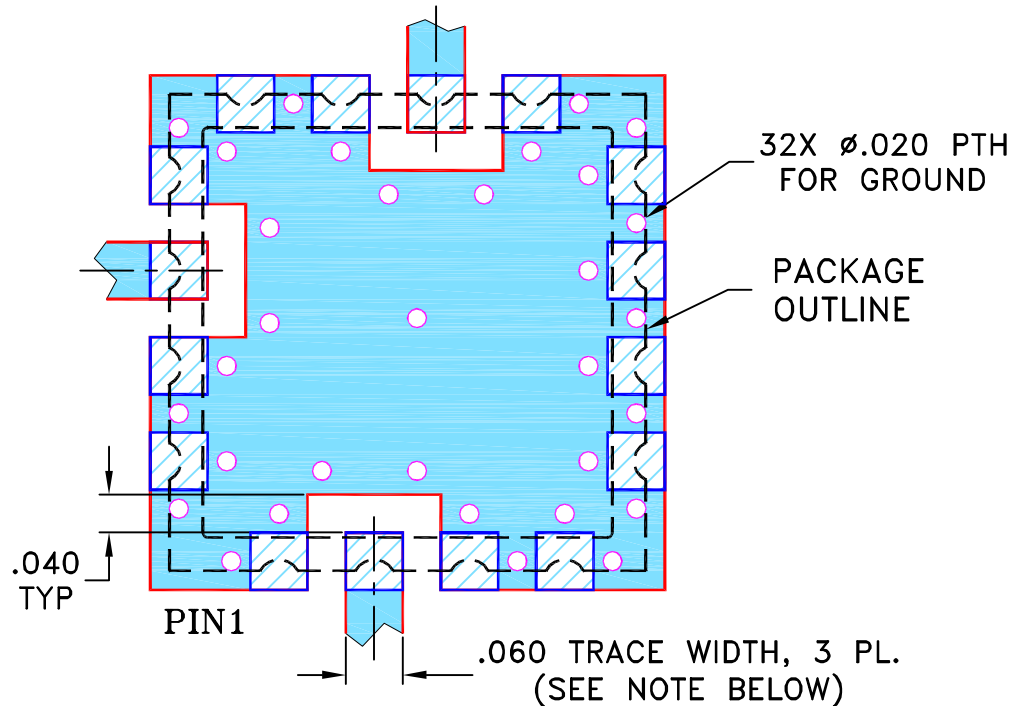
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
E	M105563	ADDED "r1" PIN CONNECTION	06/02/06	MMG	DJ
F	M105640	CORRECTED NOTE 2	06/08/06	MMG	MM
G	M124395	ADDED "RAMP"	09/09	EM	HH
G	R77589	ADDED "RAMP"	09/09	EM	HH

SUGGESTED MOUNTING CONFIGURATION FOR CK605 CASE STYLE, "kg/rl/16AM01" PIN CONNECTION

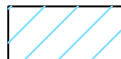


NOTES:

1. TRACE WIDTH IS SHOWN FOR FR4 WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE BOTTOM IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



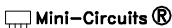
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN AV	08/07/00
TOLERANCES ON:	CHECKED SK	08/08/00
2 PL DECIMALS ±	APPROVED DB	08/08/00
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		

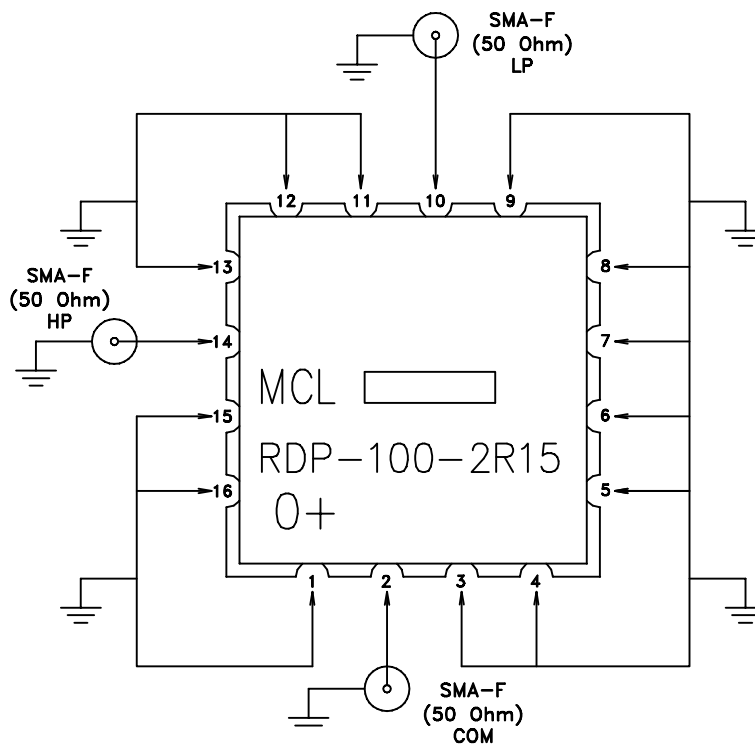
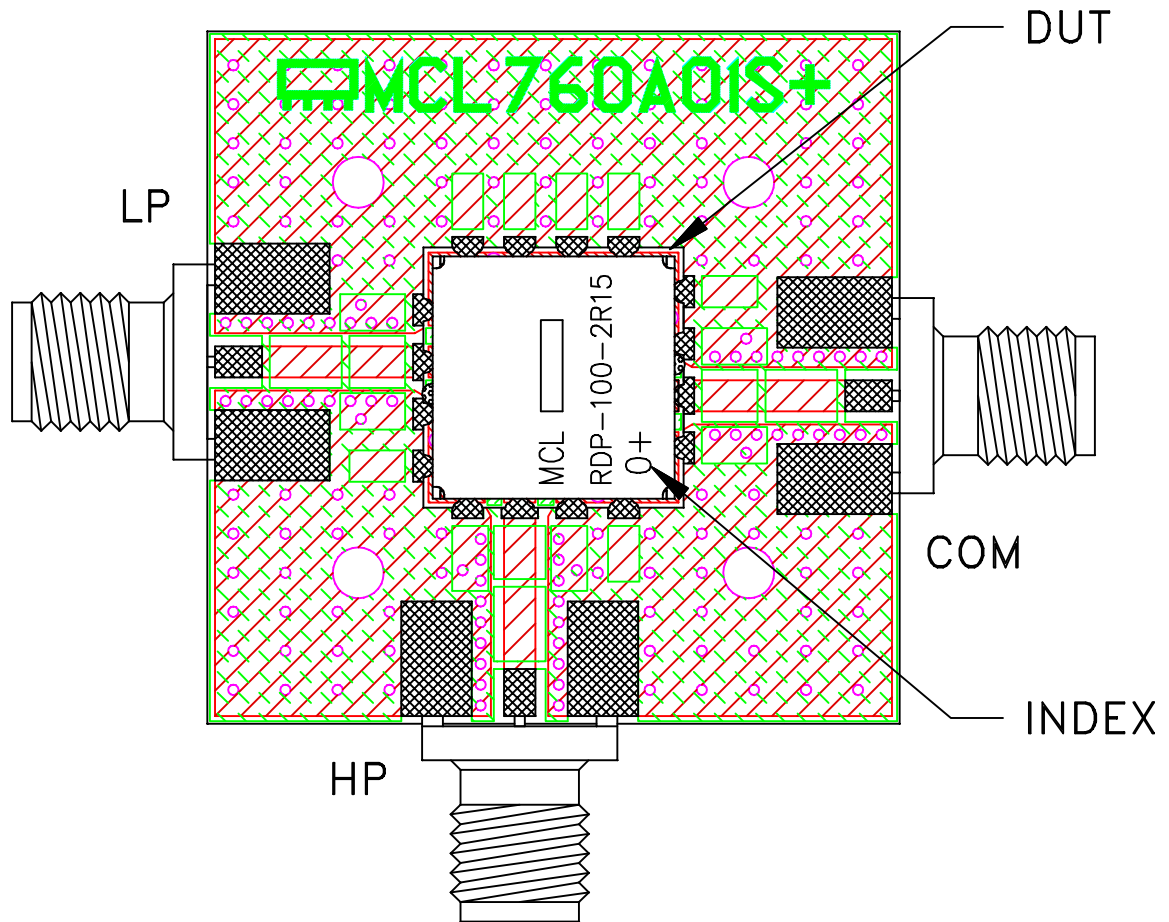
 **Mini-Circuits®** 13 Neptune Avenue  
Brooklyn NY 11235

PL,kg/rl/16AM01,CK605,ROS/LAVI/RAMP

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-012	REV: G
FILE: 98PL012	SCALE: 5:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: ROGERS (R04350B) OR Equivalent  
Dielectric Constant=3.48±.05, Thickness=.030 inch.



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215